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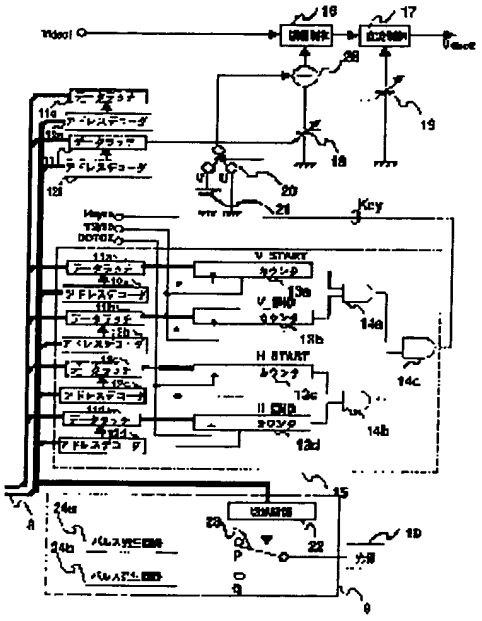
(54) PICTURE DISPLAY DEVICE AND METHOD THEREFOR

(57)Abstract:



PROBLEM TO BE SOLVED: To simultaneously display the television screen which is bright and clean and the text screen which is easy to read characters by suppressing the luminance of the characters by increasing the light quantity of a light source and associatively suppressing the picture signal levels other than an insertion section which becomes too bright.
SOLUTION: When a CPU circuit conducts an inlaid display of a natural picture, light quantity control data are transmitted to a switching control means 22 of a light quantity control means 9 through a signal bus 8. The means 22 closes a switch 23 to a p-side if the input picture signals are television signals using the control data. If the signals are for a full surface character graphic display, the switch 23 is closed to a q-side. Moreover, a pulse generating circuit 24a generates the pulse signals having wider pulse widths than the pulse widths of a pulse generating circuit 24b and the light quantity of a light source 10 is increased and the luminance of the entire screen is raised. Note that the light quantity outputted from the source 10 is increased, the amplitudes of the signals other than the inserted picture signals are associatively suppressed, only the luminance of the insertion region is increased and the television picture is cleanly displayed.

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CLAIMS

[Claim(s)]
[Claim 1] The image display device characterized by the configuration which changed the drive condition of the specific region of these two or more fields by this driving means while having the image display means which consists of a display device and the light source, the quantity of light control means which controls the quantity of light outputted from this light source, and the driving means which drives this display device, dividing the viewing area of this image display means into two or more fields, carrying out image display and changing the quantity of light of this light source.
[Claim 2] The image display device characterized by the configuration which changed the input-output behavioral characteristics of the picture signal of the specific region of these two or more fields at least by this driving means while having the image display means which consists of a display device and the light source, the quantity of light control means which controls the quantity of light outputted from this light source, and the driving means which drives this display device, dividing the viewing area of this image display means into two or more fields, carrying out image display and changing the quantity of light of this light source.
[Claim 3] The image display means which consists of a display device and the light source, and the quantity of light control means which controls the quantity of light outputted from this light source, While having the driving means which drives this display device, dividing the viewing area of this image display means into two or more fields, carrying out image display and changing the quantity of light of this light source The image display device characterized by the configuration which is interlocked with this quantity of light control means, changes a RGB drive condition by this driving means, and changed the drive condition of the specific region of these two or more fields by this driving means further.
[Claim 4] It is the image display device which chooses at least one from from for the sampling timing of the picture signal inputted into an image display means, a picture signal composition means, and this picture signal composition means among two or more sampling timing, and is characterized by the configuration as which this picture signal composition means chooses one from from among these two or more sampling timing according to the method of this image display means.
[Claim 5] The image display approach characterized by choosing one from from among these two or more sampling timing with this picture signal composition means according to the method of this image display means after choosing at least one from from for the sampling timing of the picture signal inputted into an image display means, a picture signal composition means, and this picture signal composition means among two or more sampling timing.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the image display technique which displays at coincidence the television picture which indicates it a subject by natural drawing with the computer image which makes an alphabetic character and a graphic display a subject on the same screen of the display of a liquid crystal display etc.
[0002]
[Description of the Prior Art] In recent years, when you like, the so-called multimedia services, such as an electronic encyclopedia using the VOD (Video On Demmand) service, CD-ROM, and DVD with which a favorite program is watched, prosper. Television screens, such as natural drawing, etc. are inserted in and expressed on a computer screen as such multimedia service in many cases.
[0003]
[Problem(s) to be Solved by the Invention] Generally, on the display for computers, in order are close and to see an alphabetic character and a graphic form, the operator has not made display brightness not much high so that it may be legible. On the other hand, since a television picture shows finely, it has set it as high brightness comparatively.
[0004] Brightness becomes low, it looks to advantage, and ** becomes for this reason, is not less rather than a television picture will look at them with the usual television set, if a television picture and the computer image of an alphabetic character or a graphic form are displayed on coincidence at the display unit for computers. Then, the intensity level of the alphabetic character displayed on the screen of a display unit or a graphic display and the intensity level of a natural drawing display are controlled separately, and means, such as making only a part for the display of natural drawing bright, are needed.
[0005] By the way, the picture Inn picture which inserts in and displays a child screen on the parent screen of television as an insertion display is known widely. Two or more picture signal input networks are in a television set the object for parent screens, and for child screens, amplitude level and direct current level can be separately controlled by the picture Inn picture for every picture signal, and an intensity level can be independently changed now on a parent screen and a child screen.
[0006] On the other hand, processing (synthetic processing) which inserts television pictures, such as natural drawing, in the alphabetic character and graphic display of a computer is performed by software processing of a computer etc., and the picture signal compounded by doing in this way is supplied to a display unit, and is displayed. For this reason, since one compound picture signal is supplied to a display as it is, it is a configuration with two or more picture signal input networks like a picture Inn picture in many of cases of inserting in and displaying television pictures, such as natural drawing, on the alphabetic character and graphic display of a computer, and it cannot control separately the amplitude level or direct current level of an insertion screen in principle.
[0007] On the other hand, in JP,8-251503,A, the synthetic timing on the compound picture signal is specified, and by controlling the amplitude level and direct current level of this picture signal

by specified picture signal timing, when the intensity level of the inserted-in natural drawing is controlled and it can display brightly, it is. Although picture signal amplitude level can be enlarged, driver voltage can be raised by the above-mentioned well-known example in the display of a Braun-tube method and a luminescence intensity level can be raised by it, even if it enlarges amplitude level of a picture signal, the maximum brightness still needs a device on the display of a liquid crystal method to reach only to the value equivalent to the light source quantity of light, but make the insertion section bright sharply like a Braun-tube method.

[0008] On the other hand, according to JP,4-68894,B, the picture signal of a computer By sampling R (red), G (green), and a B(blue) 3 ** primary signal to the same timing, and writing in 3 pixels which follows the horizontal direction of an image 1 dot can be correctly displayed by these 3 pixels, and R (red), G (green), and a B(blue) 3 ** primary signal are sampled to different timing, and there is a picture signal of television, when the display whose horizontal resolution improved by writing in 3 pixels which follows the horizontal direction of a screen can be performed. However, when inserting a television picture in a personal computer screen, reference is not made about a means to display with high resolution.

[0009]

[Means for Solving the Problem] This invention carries out interlocking control of the picture signal level other than the insertion section which became bright too much while increasing the light source quantity of light in displays, such as a liquid crystal display, in order to solve the above-mentioned problem.

[0010] By these, television pictures, such as natural drawing, can be displayed finely brightly, computer images, such as an alphabetic character and a graphic form, stop brightness comparatively, and it is easy to read it and they can display it.

[0011] On the other hand, in case A/D conversion of the television picture signal for insertion is carried out and it is incorporated, the resolution of television pictures, such as natural drawing inserted in a personal computer image, is raised by shifting sampling timing by R (red), G (green), and B (blue) signal.

[0012]

[Embodiment of the Invention] Hereafter, the example of this invention is explained.

[0013] Drawing 1 is the block diagram showing the 1st example of the image display device by this invention. This example is characterized by the ability to stop brightness other than an insertion image and make only an insertion image into high brightness while it increases the quantity of light outputted from the light source.

[0014] the first example of an image display device -- setting -- 1 -- an image display means and 2 -- a specific region brightness conversion means and 3 -- an image composition means and 4 -- a CPU circuit and 5 -- for an input terminal and 8, as for a quantity of light control means and 10, a signal bus and 9 are [a ROM circuit and 6 / an external input means and 7 / the light source and 32] I/F (interface) circuits.

[0015] In this drawing, the specific region brightness conversion means 2, the image composition means 3, the CPU circuit 4, the ROM circuit 5, the external input means 6, the quantity of light control means 9, and the I/F circuit 32 are connected by signal bus 8. Moreover, the equipment which consists of the image composition means 3, the CPU circuit 4, a ROM circuit 5, and an external input means 6 is good also as the same configuration as a computer. The image composition means 3 can compound two images, and can constitute them from frame memory equipment. The specific region brightness conversion means 2 changes the brightness of the specific field displayed on the image display means 1. Moreover, the quantity of light control means 9 is a means to control the quantity of light outputted from the light source 10, and to choose one of two or more light source electrical potential differences with pulse width which is different, and to control the electrical-potential-difference pulse width of the light source.

[0016] Hereafter, although actuation of this example is explained, Image B shall be inserted in Image A and Images A and B shall be expressed to coincidence as the image display means 1 here.

[0017] The CPU circuit 4 changes into a picture signal A image data A saved in the ROM circuit 5 with the image composition means 3 based on the program information stored in the ROM

circuit 5. This picture signal A is supplied to the image display means 1 through the specific region brightness conversion 2. Thereby, Image A is expressed as the image display means 1.
[0018] On the other hand, the external input means 6 is the input device of for example, a television picture signal, incorporates the picture signal B inputted from an input terminal 7, and sends it to the image composition means 3 through the signal bus 8. Of course, the circuit prepared independently [the signal bus 8] may be used for the signal transmission from the external input means 6 to the image composition means 3. This image data B is inserted in previous image data A with the image composition means 3, and it is supplied and displayed on the image display means 1. Here, Image B is inserted in and displayed into Image A so that it may illustrate.
[0019] The specific region brightness conversion means 2 can change separately the intensity level of the picture signal of the images A and B displayed with the image display means 1.
[0020] Drawing 2 is the block diagram showing one example of this specific region brightness conversion means 2 and the quantity of light control means 9. In 9, a quantity of light control means and 10 a data latch and 12 for the light source and 11 An address decoder, 13 -- a counter and 14 -- an AND gate and 15 -- a timing generating circuit and 16 -- an amplitude control means and 17 -- for a change-over switch and 21, as for a change-over control means and 24, the source of a constant voltage and 22 are [the source of good transformation, and 20 and 23 / a direct-current control means, and 18 and 19 / a pulse generator and 26] subtractors.
[0021] The CPU circuit 4 sends quantity of light control data to the change-over control means 22 of the quantity of light control means 9 through the signal bus 8, when inserting in and displaying natural drawing. With the above-mentioned control data, the change-over control means 22 closes a change-over switch 23 to the p side, when an input picture signal is a TV signal, and it closes to the q side at the time of a whole surface alphabetic character graphic display. Furthermore, pulse generating circuit 24a generates a pulse signal with wide pulse width compared with pulse generating circuit 24b, increases the quantity of light of the light source 25, and raises the brightness of the whole screen.
[0022] On the other hand, although the insertion image B can display a television picture finely by raising brightness, if the brightness of the whole screen goes up, the alphabetic character and graphic form of the personal computer image A will become hard to see.
[0023] Then, brightness other than an insertion screen area is stopped with the means expressed below.
[0024] When changing from the image field A to the image field B, the timing signal Key of the timing generating circuit 15 changes from "L" (low level) to "H" (high-level), and closes a change-over switch 20 from the v side to the u side. Thereby, the control voltage with which only the display period of the image A in the image display means 1 is impressed to the amplitude control means 16 turns into an electrical potential difference which subtracted the electrical potential difference of the source 18 of good transformation to the source 21 of a constant voltage with a subtractor 26, and the amplitude is stopped by this. Since the signal with which this amplitude was stopped is inputted into the image display means 1, only the part of Image A can stop an intensity level.
[0025] Below, actuation of the timing generating circuit 15 is shown.
[0026] The timing generating circuit 15 generates the timing signal which pinpoints the insertion location of the image B in Image A, and serves as the counter circuits 13a-13d which specify perpendicular and horizontal the starting address and ending address of Image B, AND gates 14a-14c, and the data latches 11a-11d who set each address value to counter circuits 13a-13d from address decoders 12a-12d.
[0027] the perpendicular starting address of the insertion part supplied through the signal bus 8 from the CPU circuit 4 -- data latch 11a -- the level starting address of this insertion part is stored in data latch 11c, and the level ending address of this insertion part is stored in data latch 11d for the perpendicular ending address of this insertion part at data latch 11b, respectively.
[0028] Presetting of the data of data latch 12a and the data of data latch 12b is carried out to perpendicular initiation counter 13a and perpendicular termination counter 13b with Vertical

Synchronizing signal Vsync, respectively, and presetting of the data of data latch 11c and the data latch 11d data is carried out to level initiation counter 13c and level termination counter 13d with Horizontal Synchronizing signal Hsync, respectively. And perpendicular initiation counter 13a and perpendicular termination counter 13b make Horizontal Synchronizing signal Hsync a count clock signal, respectively, and the dot clock signal DOTCK is made into a counter clock signal level initiation counter 13c and level termination counter 13d, respectively. As for the output of perpendicular initiation counter 13a and perpendicular termination counter 13b, an AND is taken by AND gate 14a, an AND is taken by AND gate 14b, and, as for level initiation counter 13c and a level termination counter 13d output, the timing signal Key with which an AND is taken by AND gate 14c, and the output of these AND gates 14a and 14b shows the insertion location of Image B further is acquired. A timing signal Key is "H" (high level) at the time of an insertion part (image B), and closes a change-over switch 20 to the u side. Moreover, a change-over switch 20 is closed to the v side by "L" (low level) at the time of the other part (image A).

[0029] Moreover, the data with which the data which define the direct current level of the whole screen supplied through the signal bus 8 from the CPU circuit 4 set the amplitude level of this whole screen to data latch 11e are stored in data latch 11f, respectively. Whole direct current level and amplitude level are controlled by inputting into the sources 19 and 18 of good transformation the data stored in data latch 11e and f, respectively.

[0030] Drawing 3 is drawing in which dividing relation with the level of this timing signal Key and a picture signal into a horizontal scanning period and a vertical-scanning period, and showing it.

[0031] In this drawing, the part by which hatching was carried out with the slash of the synthetic picture signal Video1 from the image composition means 3 is an insertion part of Image B, and although a timing signal Key is usually "L" (low level), it serves as "H" (high-level) in this insertion part.

[0032] as mentioned above, the thing which gang control of the amplitude other than an insertion picture signal is carried out, and is suppressed for it while increasing the quantity of light outputted from the light source -- the insertion field B -- brightness -- raising -- a television picture -- bright -- beautiful -- displaying -- the field of personal computer images, such as an alphabetic character and a graphic form, -- brightness -- ** -- now, it can be made legible.

[0033] In addition, it cannot be overemphasized that it is easy to be natural [the external input means 6] also in the digital method corresponding to CATV used by a VOD system etc., LAN, and ISDN.

[0034] Moreover, as shown in drawing 4 , data accumulation equipment 25 may be used instead of the external input means 6. A solid-state magnetic disk, a magnetic disk or a magneto-optic disk, CD-ROM, DVD, etc. are sufficient as this data accumulation equipment 25, and the image data equivalent to Images A and B is accumulated.

[0035] Moreover, ROM5 which accumulated the image data equivalent to Images A and B instead of the external input means 6 is sufficient, and you may make it form the external input means 6 and data accumulation equipment 25 in this further, as are shown in drawing 5 , and shown in drawing 6 .

[0036] The 2nd example of this invention is shown in drawing 7 . The description of this example is having established a means various control, such as a gamma property's and a hue's, having been performed easily.

[0037] Since a gamma property differs from the Braun tube, when it displays without applying amendment to a picture signal, it is necessary to stop being able to express gradation by the side of black and white, to amend a picture signal, and to improve the gradation property by the side of black and white in a liquid crystal display. There are many displays saturated with the personal computer image in the white or black side, and although importance is seldom attached to a gradation property, it is important in a TV signal with much body warmth etc.

[0038] As for a change-over switch and 28, in drawing 7 , an A/D converter and 29 omit [27] the explanation which LUT (look-up table) and 30 are D/A converters, attach the same sign to the part corresponding to drawing 3 , and overlap.

[0039] This example is also making the configuration which shows a whole configuration in drawing 1 . The point that this example differs from the example shown in drawing 2 greatly is

providing a means performing conversion of the gamma property of an insertion part, or a hue by digital signal processing, and consists of D/A converter 30 and change-over switches 27a and 27b which change into an analog picture signal LUT29 and the digital image signal as A/D converter 28 which changes an analog picture signal into a digital image signal for the digital adjustment means 34 for it, and a digital data transducer.

[0040] Below, actuation is explained.

[0041] With the timing signal Key from a timing generator 15, change-over switches 27a and 27b close only the period of an insertion part to the B side. At this time, the signal of the image B of a picture signal Video1 is digitized with A/D converter 28, and is supplied to LUT29. Based on the gamma property data of the image display means 1 etc., translation data is inputted into LUT29 through the signal bus 8 from the CPU circuit 4, and the gamma property and hue of a picture signal Video1 are set to a desired value with this translation data. This LUT29 can be constituted from memory, such as EEPROM, and can also make data rewriting from the CPU circuit 4 as it pleases.

[0042] The whole amplitude and control of direct current level are made like the example shown in drawing 2 by the amplitude control means 16 and the direct-current-level control means 17, and the output data of this LUT29 are outputted as a picture signal Video2, after being changed into an analog picture signal with D/A converter 30. Thereby, only the period of Image B can control a gamma property and a hue now by LUT29.

[0043] In addition, although change-over switches 27a and 27b are arranged after D/A converter 29 an A/D-converter 28 front, respectively and he is trying to switch an analog picture signal in drawing 7 , change-over switches 27a and 27b are arranged in front of D/A converter 29 the A/D-converter 28 back, respectively, and you may make it switch a digital image signal.

[0044] As mentioned above, when an insertion screen is a television screen While increasing the quantity of light outputted from the light source 10 like drawing 2 and raising whenever [** / of the whole screen] By inserting in by the amplitude control means 16, stopping brightness other than a part, and changing the gamma property and hue of television picture B with the digital adjustment means 34 further The gradation property by the side of black and white is improvable, and while it is brightly beautiful and being able to display television picture B with a sufficient gradation property, it is compatible in the alphabetic character graphic display which is easy to read.

[0045] The 3rd example of this invention is shown in drawing 8 . Although the configuration that a whole configuration also shows this example to drawing 1 is made, it is characterized by suppressing collapse of the output light color balance which occurs at the time of quantity of light change of the light source 10 by controlling separately the control voltage by which a seal of approval is carried out to the amplitude control means 16a, 16b, and 16c of R (red), G (green), and B (blue) according to the quantity of light outputted from the light source 10.

[0046] In this drawing, when increasing the quantity of light of the light source 10, change-over switches 42a, 42b, and 42c are closed to the p side by the quantity of light control means 9. Although the electrical potential difference of the adjustable electrical potential differences 26a, 26b, and 26c is added to the control voltage of the amplitude control means 16 through Adders 43a, 43b, and 43c, he is trying to change separately the adjustable electrical potential differences 26a, 26b, and 26c. Therefore, since the control voltage of the amplitude control means 16 can be separately changed by R (red), G (green), and B (blue) and the amplitude of R (red), G (green), and B (blue) signal can be separately controlled by adjusting the sources 26a, 26b, and 26c of good transformation, collapse of the color balance of the light outputted from the light source 25 can be suppressed. Moreover, since the electrical potential difference of the sources 26a, 26b, and 26c of good transformation is added in the image field A and the field of B both when the quantity of light of the light source 10 is increased, a color can be correctly expressed in all the fields of the image display means 1. Furthermore, brightness control of the image fields A and B can be performed like drawing 2 by changing the control voltage of the amplitude control means 16 in the timing generating circuit 15, the source 18 of good transformation, a change-over switch 20, and the source 21 of a constant voltage.

[0047] controlling the control voltage of the amplitude control means 16 by R (red), G (green),

and B (blue) separately, even if the color balance of light collapses with the increment in the quantity of light of the light source 10 as mentioned above -- collapse of the color balance of the whole screen -- stopping -- in addition -- and brightness control of the image fields A and B can be performed.

[0048] The 4th example of this invention is shown in drawing 9 . This drawing is characterized by the ability of the picture signal inputted from an input terminal 7 to raise the resolution of Image B with a TV signal by changing sampling timing by R (red), G (green), and B (blue), when the image display means 1 is a matrix method.

[0049] In the 4th example, the information on whether the image display means 1 is a Braun-tube method or it is a matrix method is sent to the CPU circuit 4 through the I/F circuit 32, and the CPU circuit 4 recognizes the method of the image display means 1 using the sent information. Furthermore, the CPU circuit 4 sets up the sampling timing of the external input means 6 through the signal bus 8. Thus, even if a computer operator exchanges the image display means 1 from a Braun-tube method to a matrix method by enabling it to communicate the CPU circuit 4 and the image display means 1 through the I/F circuit 32, an operator does not need to change a setup etc. and the CPU circuit 4 can realize a change and a beautiful natural drawing display to the optimal sampling timing automatically.

[0050] the block diagram in which drawing 10 shows one example of the external input means 6 -- it is -- 31 -- an I/F circuit and 33 -- a synchronizing separator circuit and 34 -- a PLL circuit and 36 -- an A/D converter and 37 -- for a phase delay circuit and 38, as for a change-over switch and 40, an I/F circuit and 41 are [a phase delay circuit and 39] RGB decoders. [about 120-degree] [about 240-degree]

[0051] The Video signal inputted from the input terminal 7 is inputted into the RGB decoder 41, the RGB decoder 41 divides the inputted Video signal into R, G, and B chrominance signal, and R, G, and B chrominance signal are inputted into A/D converters 36a, 36b, and 36c. Moreover, a Video signal is inputted into a synchronizing separator circuit 33, a Horizontal Synchronizing signal is taken out by the synchronizing separator circuit 33, a Horizontal Synchronizing signal is inputted into the PLL circuit 34, and a sampling pulse 1 is generated. Moreover, a sampling pulse 1 turns into the sampling pulses 2 and 3 to which 120 degrees (120 degrees and about 240 degrees) were shifted by the phase delay circuits 37 and 38, and it shifted about 240 degrees of phases, respectively. The I/F circuit 31 incorporates the sampled signal and sends a signal to the image composition means 3 through the signal bus 8. the data from the CPU circuit 4 sent through the signal bus 8 in this drawing -- the image display means 1 -- a matrix method -- it is -- in addition -- and -- the time of the signal inputted from an input terminal 7 being a TV signal -- a change-over switch 39 -- a and b are closed to the p and s side, respectively. The sampling pulses 1, 2, and 3 from which 120 degrees of phases shifted, respectively are sampled to the timing of "H" (high-level), and R and G which are outputted from a RGB decoder by this, and B chrominance signal are inputted into the external input terminal 6. Therefore, it can insert in and a television picture with high resolution can be displayed on an image field. Moreover, when the image display means 1 is a Braun-tube method, since change-over-switch 39a and b are closed to the q and r side, respectively with the data sent through the signal bus 8 from the CPU circuit 4, R, G, and B chrominance signal are sampled to the same timing. Therefore, the color of the personal computer image displayed on an insertion field is correctly reproducible.

[0052] Drawing 11 is drawing showing the relation of the pixel of R, G, B chrominance signal, a sampling pulse, and liquid crystal.

[0053] In this drawing, when the image display means 1 is the display of a matrix method, R signal of an external input TV signal is sampled in the standup of a sampling pulse 1, and is inputted into R pixels. Moreover, G and B signal are also sampled in the standup of sampling pulses 2 and 3, respectively, and are inputted into G and B pixels, respectively. On the other hand, when the image display means 1 is a Braun-tube method, it is the standup of a sampling pulse 2, and R, G, and B signal are sampled by coincidence and inputted into R, G, and B pixels, respectively.

[0054] The optimal insertion display can be performed by changing the sampling timing of a picture signal of inputting the image display means 1 from an input terminal 7 by the Braun-tube

method and matrix methods, such as liquid crystal and PDP, as mentioned above.

[0055]

[Effect of the Invention] As explained above, according to this invention, in a liquid crystal display, brightness control of only an insertion image can be performed and the coincidence display with a beautiful bright television screen and the text screen which is easy to read the alphabetic character which stopped brightness is attained. Moreover, since the sampling timing of an external input picture signal is automatically changeable, the optimal insertion display can be performed by the Braun-tube method and matrix methods, such as liquid crystal and PDP.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the block diagram showing the 1st example of the image display device by this invention.
[Drawing 2] It is the block diagram showing one example of the means in drawing 1 .
[Drawing 3] It is the timing chart which shows actuation of the example shown in drawing 1 .
[Drawing 4] It is the block diagram showing the example of a complete-change form of the 1st example shown in drawing 1 .
[Drawing 5] It is the block diagram showing other modifications of the 1st example shown in drawing 1 .
[Drawing 6] It is the block diagram showing the modification of further others of the 1st example shown in drawing 1 .
[Drawing 7] It is the block diagram showing the 2nd example of the image display device by this invention.
[Drawing 8] It is the block diagram showing the 3rd example of the image display device by this invention.
[Drawing 9] It is the block diagram showing the 4th example of the image display device by this invention.
[Drawing 10] It is the block diagram showing one example of the means in drawing 9 .
[Drawing 11] It is the timing chart which shows actuation of the example shown in drawing 10 .
[Description of Notations]
1 -- Image display means 2 -- Specific region brightness conversion means
3 -- Image composition means 4 -- CPU circuit
5 -- ROM circuit 6 -- External input means
7 -- Input terminal of a picture signal 8 -- Signal bus
9 -- Quantity of light control means 10 -- Light source
11 -- Data latch 12 -- Address decoder
13 -- Counter 14 -- AND gate
15 -- Timing generating circuit 16 -- Amplitude adjustment means
17 -- Direct-current control means 18 -- Source of good transformation
19 -- Source of good transformation 20 -- Change-over switch
21 -- Source of a constant voltage 22 -- Change-over control means
23 -- Change-over switch 24 -- Pulse generator
25 -- Data accumulation equipment 26 -- Subtractor
27 -- Change-over switch 28 -- A/D converter
29 -- LUT (look-up table)
30 -- D/A converter 31 -- I/F (interface) circuit
32 -- I/F circuit 33 -- Synchronizing separator circuit
34 -- PLL circuit 35 -- Digital adjustment means
36 -- A/D converter It is a phase delay circuit about 37--120 degrees.
It is a phase delay circuit about 38--240 degrees.
39 -- Change-over switch 40 -- I/F circuit

41 -- RGB decoder 42 -- Adder
43 -- Change-over switch

[Translation done.]